or whether it has a signaling function during neural tube morphogenesis. In addition, we are investigating the role of two genes, which also appears to be required for proper neural tube morphogenesis, *Strabismus* (a zebrafish homologue of *Van-Gogh-like2*, a component of the non-canonical *Wnt* pathway) and *bumpy brain* (yet unidentified gene). Interestingly, these genes interact genetically with *N-cad* suggesting that they may function in the same or closely related pathways.

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Program/Abstract # 412
A cell cycle regulatory gene contributes to zebrafish somitogenesis

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In vertebrates, somites form in an anterior to posterior wave, with new somites deriving from tissue generated by the growing tail bud. Morphological segment boundary formation is presaged by oscillating gene expression cycles regulated in part by Notch signaling; these "waves" of gene expression begin in the tail bud and move anteriorly into the presomitic mesoderm (PSM) until they encounter a "wavefront" that stabilizes gene expression. In vertebrates, opposing gradients of FGF, Wnt and Retinoic Acid (RA) signaling converge to form the wavefront (e.g., Dubrulle et al., 2001; Sawada et al., 2001; Diez del Corral et al., 2003; Aulehla et al., 2003). In zebrafish, *fgf8* is expressed in a gradient, with highest expression in the tail bud and decreasing anteriorly; Fgf8 signaling antagonizes and thereby positions the wavefront (Sawada et al., 2001). *gadd45b*, a member of a family of genes induced under growth arrest and DNA damaging conditions, is expressed in a bilateral stripe in the zebrafish PSM (Durbin, et al., 2000). We have shown that *gadd45b* is expressed in the PSM at the anterior limit of Fgf signaling and that Fgf negatively regulates *gadd45b* expression. Interestingly, *gadd45b* expression is less sensitive to perturbation of other wavefront signals such as RA. We are using *gadd45b* depletion to further understand the role of Gadd45b in patterning and somite differentiation.

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Program/Abstract # 413
Functional significance of the E-cadherin/N-cadherin switch at the onset of Neurulation

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At the onset of neurulation, E-cadherin (E-cad) and N-cadherin (N-cad), two calcium-dependent adhesion molecules belonging to the classical cadherin subfamily, are expressed in complementary domains within the ectoderm of all vertebrates. E-cad is downregulated in the neural ectoderm and retained in the non-neural ectoderm. Conversely, N-cad is up-regulated in the neural plate. This switch in cadherin expression is also observed in other developmental contexts and prior to metastasis. In most systems in which these adhesion molecules have been studied, E-cad is typically found in highly polarized epithelia, where it is thought to maintain stable cell–cell interactions, whereas N-cad is associated with mesenchymal tissues that undergo cellular rearrangements. It has therefore been hypothesized that E-cad may promote epithelial cytoarchitectures whereas N-cad mediates dynamic cell behaviors such as migration. However, *in vivo* data to support this hypothesis is lacking. Here, we address, using the zebrafish as a model system, whether the non-overlapping expression domains of E-cad and N-cad reflect a differential role for these adhesion molecules during neurulation. We are currently analyzing the dynamic expression of *E-cad* and *N-cad* prior to the onset of neurulation and correlating these expression patterns with the cytoarchitecture of neural and non neural cells. We will next determine whether ectopic expression of E-cad in the neural ectoderm is able to rescue the neurulation defects in *N-cad* mutants. Our ultimate goal is to identify functional domains within E-cad and N-cad that may account for their distinct properties.

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Program/Abstract # 414
Sox4b is required for pituitary expression of *gata2* and specification of thyrotrope cells in zebrafish

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The adenohypophysis consists of at least six different cell types: somatotropes, lactotropes, thyrotropes, melanotropes, corticotropes and gonadotropes in mammals, and an additional cell type in fish expressing somatolactin. We investigate the role of Sox4b, a member of the SRY-like HMG-box (SOX) family in pituitary development. We found that *sox4b* is strongly expressed in the pituitary anlagen starting at 24 hpf and in the entire head region including the pituitary at 48 hpf. We show that *sox4b* mRNA colocalizes with the pan-pituitary marker *lim3* at 33 hpf and with *tshb* at 48 hpf. *sox4b* knock-down leads to a drastic decrease in *tshb* and *gsua* expression and reduced levels of *gh* and *slb* mRNA, while other anterior pituitary gland markers including *prl* and *lim3* are not affected. Furthermore, expression of the zinc finger transcription factor *gata2* is downregulated in